

REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Official Action dated April 20, 2004. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

Claims 1-4, 7-13 and 17-19 are under consideration in this application. Claims 1-4, 7-13 and 17-19 are being amended, as set forth above and in the attached marked-up presentation of the claim amendments, in order to more particularly define and distinctly claim Applicants' invention.

Additional Amendments

The claims are being amended to correct formal errors and/or to better disclose or describe the features of the present invention as claimed. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Formality Rejection

The Examiner objected to the drawings for failing to show the feature of "the same level" recited in claims 1-4, 7-10 and 18-19. The Examiner further rejected claim 13 and 17 under 35 U.S.C. §112, second paragraph, for reciting "gain lines". As indicated, the claims have been amended as required by the Examiner. Accordingly, the withdrawal of the outstanding informality rejection is in order, and is therefore respectfully solicited.

Prior Art Rejection

Claims 1-4, 7-12, 18-19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. No. 6,462,727 to Shin (hereinafter "Shin"), and in view of JP Pat. No. 04-168417 to Takahara et al. (hereinafter "Takahara"). These rejections have been carefully considered, but are most respectfully traversed.

The liquid crystal display device of the invention (e.g., Figs. 1, 6A), as now recited in claim 1, comprises: a liquid crystal display element 10 with a plurality of drain signal lines D;

a plurality of driving circuits 130 including a first driving circuit and a second driving circuit, each of the driving circuits having a plurality of output terminals; and a display control device 110 transmitting display data DATAIN *alternately* to one of the output terminals of the first driving circuit and to one of the output terminals of the second driving circuit which is arranged next to the first driving circuit (p. 17, lines 7-13; p. 27, lines 7-13; Fig. 6B: D11 -> D21 -> D12-> D22 -> ... D1n -> D2n ->... D31-> D41-> D32-> D42 ...). At least one of the first and second driving circuits has at least one output terminal being not connected to the drain signal lines (e.g., “*a first drain driver DRV1 has 1 to (n-1) output terminals which are not connected to the drain signal lines*” p. 28, lines 24-27 and Fig. 6A; “*the last drain driver DRV4 has unconnected output terminals*” p. 33, lines 8-12 and Fig. 10; “*the drain drivers DRV1 and DRV2 have unconnected output terminals...[on] arbitrary positions*” p. 34. Lines 12-15 and Fig. 13) and each of the remaining output terminals being connected to one of the drain signal lines. The display control device transmits to said output terminal being not connected to the drain lines “*a display datum being transmitted prior or subsequently to an output terminal being connected to one of the drain signal lines*”(e.g., Figs. 6B, 12B; “*data to be transmitted to unconnected output terminal portions (ineffective display data) become the same display data as those of the drain driver DRV3*” p. 33, lines 24-26), i.e., the “**“same-data” feature.**

The present invention, as now recited in claim 3, is also directed to a liquid crystal display device as recited in claim 1, except that the plurality of driving circuits including at least one *odd numbered* driving circuit and at least one *even numbered* driving circuit (rather than just a first and second), and that the even numbered driving circuit is *paired with* and arranged next to the odd numbered driving circuit.

The present invention, as now recited in claims 2 and 4, mirror claims 1 and 3, respectively, but broader to cover all display devices (beyond liquid crystal display devices). The present invention, as now recited in claim 7 (Fig. 7), is also directed to a liquid crystal display device as recited in claim 3, having a first storing means 20 (“*odd-numbered memory*” p. 27, lines 17-21; Fig. 7) for storing display data for said odd numbered driving circuit which are inputted externally and a second storing means 21 (“*even-numbered memory*”) for storing display data for said even numbered driving circuit which are inputted externally, and that the display control device reads out the display data from the first storing means and the second storing means alternately (p. 31, lines 6-12) to transmit to said output terminals being connected

to one of the drain signal lines. In particular, before transmitting a display datum D21 to said output terminal being not connected to the drain signal lines (e.g., any one of the terminals 1-(n-1) of DRV1 in Fig. 6A), the display control device 110 reads out from one of said first and second storing means a display datum D21 to be transmitted immediately prior or subsequently to transmitting said display datum to said output terminal being not connected to the drain signal lines (e.g., terminal 1 of DRV2), and then repeatedly transmits said display datum D21 to (1) said output terminal being not connected to the drain signal lines (e.g., terminal 1 of DRV1) and (2) an output terminal being connected to one of the drain signal lines and scheduled to receive said display datum immediately prior or subsequently to the transmitting of said display datum to said output terminal being not connected to the drain signal lines (e.g., terminal 1 of DRV2), i.e., the “**repeated-data**” feature.

For example, in Fig. 6A (p. 32, lines 12-20), “*display data are transmitted in the order of D21, D21, D22, D22, D23, D23...*” (“repeating mode”) until running out of unconnected output terminals then switching back to “D1n, D2n, D1n+1...” (“alternating mode”), i.e., the “dual-mode” feature. As such, a plurality of drivers DRV1 to DRVn share a common display control device 110 which includes a pair of memory 20, 21 so as to reduce the cost of the display panel (p. 43, lines 3-5). Accordingly, “*during transmission of display data containing ineffective display data, it is possible to reduce the transmission frequency on the bus line, whereby it is possible to reduce the amount of generation of radiant electromagnetic noise* (p. 32, last paragraph)”.

Applicants respectfully contend that none of the cited references teaches or suggests such a “same-data” or “repeated-data” feature.

In contrast, Shin merely discloses “the first odd data d1 and the first even data d2 are sent to the first odd data driver IC 240 and the first even data driver IC 250, respectively (Col.5, line 63 – Col. 6, line 2).” As admitted by the Examiner (p. 3, last paragraph of the outstanding office action), Shin does not show any output terminal being *not connected* to the drain lines.

Takahara was relied upon by the Examiner to teach such a feature. However, Takahara merely discloses to skip unused pin, but does not disclose the datum transmitted to the unused pin **being or repeating** the datum transmitted to the used pin, or the problem of the transmission frequency on the bus line. In addition, Takahara’s display control device simply transmits the display datum to the used pins in the order as the used pins have been physically arranged (i.e., transmitting to all used pins/terminals in DRV 1 but skipping unused pins, then all used pins in

DRV 2 but skipping unused pins, etc), rather than *alternately* to one of the output terminals of the first driving circuit and to one of the output terminals of the second driving circuit which is arranged next to the first driving circuit (i.e., transmitting to all terminals without skipping. In other words, terminal 1 of DRV1-> terminal 1 of DRV2-> terminal 2 of DRV1-> terminal 2 of DRV2-> ... terminal n of DRV1-> terminal n of DRV2->... terminal 1 of DRV3-> terminal 1 of DRV4-> ...). Please see the attached explanatory charts Figs. A & B.

Therefore, Takahara not only fails to disclose the same-data or repeated-data feature, but also *teaches away* from the invention (transmitting the same data to a non-connected terminal/pin) by skipping (not transmitting any signals to) the unused/unconnected pins/terminals. It is well established that a rejection based on cited references having principles that teach away from the invention is improper.

Contrary to the Examiner's allegation that it is obvious to one skilled in the art at the time of invention to input Takahara's start and clock pluses (ST, CLK), which have a same level as a display datum (SI) being transmitted prior or subsequently to an output terminal being *connected* to one of the drain signal lines (Figs. 3 & 5), to Tanahara's output terminal being *not connected* to the drain lines (p. 4, 2nd full paragraph of the outstanding office action), one skilled in the art will not be motivated to input Takahara's start and clock pluses (ST, CLK) to its unused pin, since Takahara specifically requires to skip unused pins, i.e., not input any signal to the unused pin. It is well established that a rejection based contradictory principles in the same priori art reference is improper.

Even if, arguendo, a person of ordinary skill were motivated to combine the teachings in Takahara and Shin, such combined teachings would still fall short in fully meeting the Applicants' claimed invention as set forth in claims 1-4 since Takahara, at most, shows the start and clock pluses ST, CLK having a same level as a display datum SI, but not the same datum or repeated datum (having same pulse form, frequency, etc. in addition to level) being transmitted prior or subsequently to an output terminal being connected to one of the drain signal lines. As discussed, there is no teaching of the same-data feature in either Takahara or Shin.

In addition, the Examiner's reliance upon the "common knowledge and common sense" of one skilled in the art for the allegedly obviousness and any motivation for combining the teachings in Takahara, i.e., inputting Takahara's start and clock pluses (ST, CLK) to Tanahara's output terminal being *not connected* to the drain lines, did not fulfill the agency's obligation to cite references to support its conclusions. Instead, the Examiner must provide the specific

teaching of allegations of obviousness or motivation to combine on the record, such as *statements in the prior art*, to allow accountability.

*To establish a prima facie case of obviousness, the Board must, inter alia, show "some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). "The motivation, suggestion or teaching may come explicitly from *statements in the prior art*, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved." Kotzab, 217 F.3d at 1370, 55 USPQ2d at 1317. Recently, in In re Lee, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002), we held that the Board's reliance on "common knowledge and common sense" did not fulfill the agency's obligation to cite references to support its conclusions. Id. at 1344, 61 USPQ2d at 1434. Instead, the Board must document its reasoning on the record to allow accountability. Id. at 1345, 61 USPQ2d at 1435.*

See In re Thrift, 298 F.3d 1357.

Such an obligation to provide specific teaching(s) also applies to other existing or future obviousness rejections.

Although the invention applies the general signal-repeating mechanism, the invention applies the mechanism for unused pins of driving circuits in a liquid crystal display device to achieve unexpected results or properties. For example, reducing the transmission frequency on the bus line and the amount of radiant electromagnetic noise. The presence of the unexpected properties is evidence of nonobviousness. MPEP§716.02(a).

"Presence of a property not possessed by the prior art is evidence of nonobviousness. In re Papesch, 315 F.2d 381, 137 USPQ 43 (CCPA 1963) (rejection of claims to compound structurally similar to the prior art compound was reversed because claimed compound unexpectedly possessed anti-inflammatory properties not possessed by the prior art compound); Ex parte Thumm, 132 USPQ 66 (Bd. App. 1961) (Appellant showed that the claimed range of ethylene diamine was effective for the purpose of producing "regenerated cellulose consisting substantially entirely of skin" whereas the prior art warned "this compound has 'practically no effect.'").

Although "[t]he submission of evidence that a new product possesses unexpected properties does not necessarily require a conclusion that the claimed invention is nonobvious.

In re Payne, 606 F.2d 303, 203 USPQ 245 (CCPA 1979). See the discussion of latent properties and additional advantages in MPEP § 2145,” the unexpected properties were unknown and non-inherent functions in view of Takahara, since Takahara does not inherently achieve the same results. In other words, these advantages would not flow naturally from following the teachings of Takahara, since Takahara fails to suggest such a “same-data” or “repeated-data” feature.

Applicants further contend that the mere fact that one of skill in the art could rearrange Takahara to meet the terms of the claims is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for one skilled in the art to provide the unexpected properties, such as reducing the transmission frequency on the bus line and the amount of radiant electromagnetic noise, without the benefit of appellant's specification, to make the necessary changes in the reference device. *Ex parte Chicago Rawhide Mfg. Co.*, 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984). MPEP§2144.04 VI C.

Accordingly, the present invention as now recited in all the independent claims is distinguishable and thereby allowable over the rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

Conclusion

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art reference upon which the rejections in the Office Action rely, Applicant respectfully contends that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of

the above-captioned application, the Examiner is invited to contact the Applicant's undersigned representative at the address and phone number indicated below.

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October 19, 2004

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